

Colour Analysis (Elementary)

Purpose: To determine if the water sample meets Canadian Drinking Water Guidelines for Colour. Testing will be done on Local community treated water.

The Canadian Drinking Water Guidelines has an aesthetic objective of 15 TCU (True Colour Units) for drinking water; you will test and compare your result to see if it meets these guidelines.

Materials:

- 1 - Canadian Guideline Limit Sample for Colour (CGLS)
- 3 - Large glass test tubes

Method:

1. Label the test tubes; Control, Canadian Guideline, and Local community sample,
2. Pour the 50ml of Canadian Guideline to the Canadian Guideline test tube.
3. Fill the Control test tube with the deionized water to the same level as the Canadian Guideline test tube.
4. Fill the Sample test tube with Local community water to the same level as the Canadian Guideline test tube.
5. Hold the Local community test tube side by side with the Control, and Canadian Guideline tubes over a white piece of paper
6. View the test tubes from above: Is the colour of the Sample lighter or darker than the colour of the Canadian Guideline tube?
7. Record the results

Results:

If the water sample has a colour lighter or equal to that of the Canadian Guideline then it passes the Canadian Drinking Water Guideline for Colour.

If the water sample is darker in colour than that of the Canadian Guideline, it fails the Canadian Drinking Water Guideline of 15 TCU (True Colour Units).

Safe Handling of Materials

Caution must be taken at all times when handling any chemicals. Although this test is safe to use in any area, please be cautious with the materials supplied.

Operation Water Drop

Visit the Safe Drinking Water Foundation Website www.safewater.org

Visit the Safe Drinking Water Foundation Website www.safewater.org to learn more about issues affecting safe drinking water.

Colour:

Where does the colour of the water come from?

When water has a visible tint to it, it is usually due to the presence of decaying organic material or inorganic contaminants such as iron, copper, or manganese. Limits for colour in drinking water are usually set based on aesthetic considerations. The Canadian guidelines are set at 15 TCU (True Colour Units), as most people can easily detect colour exceeding this level. Generally, colour is classified into two types: true and apparent colour. The most common cause of true colour is decaying organic material such as dead leaves and grass. This type of colour is usually found in surface water. Apparent colour is caused by inorganic materials, usually iron, copper or manganese. The true colour of water can be distinguished from the apparent colour by filtering the sample to remove the larger organic particles. The following table lists some frequent colours that may be detected in drinking water and their most common causes.

Colour	Cause	Health Hazards/Other Problems
Red or Brown	Generally indicative of iron or manganese in water	Stains sinks and discolours laundry
Yellow	Suspended organic particles	No adverse health risks (unless chlorinated; see below)
Blue or Green	Generally due to copper in water supply or corrosion of copper pipes leading into water supply	Can cause staining of fixtures and laundry; high contents of copper (30ppm) can cause vomiting, diarrhoea, and general gastrointestinal

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		symptoms
Cloudy, White, or Foamy	Usually due to turbidity (finely divided particles in water, either organic or inorganic)	No adverse health risks but can cause abrasions to pipes and staining of fixtures

What are the health risks associated with drinking coloured water?

Generally speaking, the colour in water does not pose any health risks. However, there are some exceptions. If the colour is due to a metal contaminant, such as copper, mild gastrointestinal symptoms may result. Therefore, Canadian guidelines stipulate certain recommended limits to many inorganic materials. Also, when chlorinated, any organic material that is present in the water can combine with the chlorine to form compounds called trihalomethanes (THMs). Chloroform is a common THM and is considered potentially carcinogenic (cancer causing). Therefore THMs in drinking water supplies that are routinely chlorinated are closely monitored and also have recommended limits.

What do I do if my water exceeds colour limits?

Colour in water can easily be removed using activated carbon filters (charcoal). However, these filters need to be replaced periodically to maintain colour absorption activity. In larger plants, a common treatment method called coagulation and sedimentation is used. This method utilizes alum and other chemicals to remove the materials that cause colouration of drinking water, before being pumped out to people's homes.